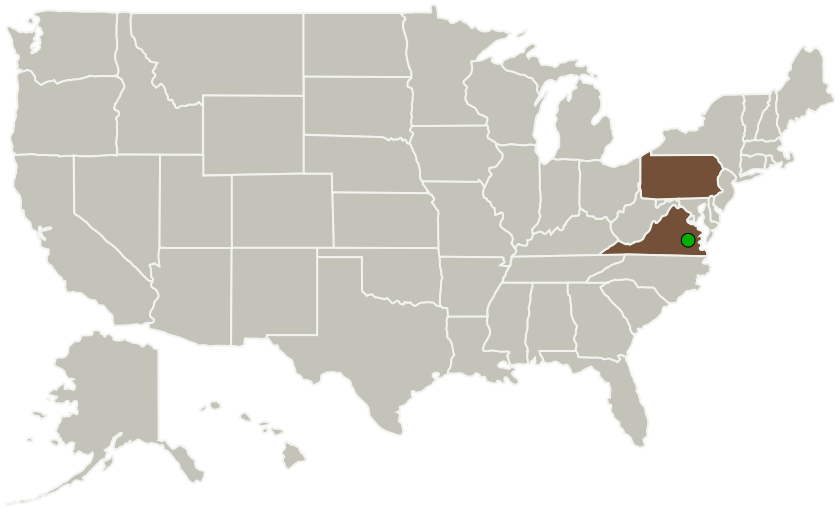
Weather Aware Route Planning (WARP), Phase II

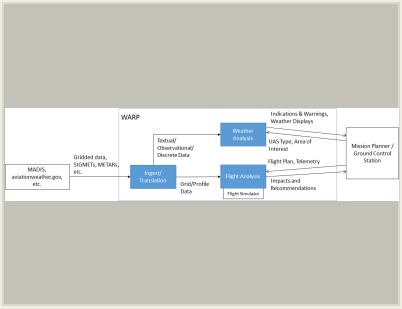
Completed Technology Project (2016 - 2018)

Project Introduction

In Phase I of this NASA SBIR project, Daniel H. Wagner Associates, Inc., designed and demonstrated the feasibility of a system for integrating environmental data into flight planning and execution for Unmanned Air Systems (UAS) in the National Airspace System (NAS). The Weather Aware Route Planning (WARP) system will provide weather-based Indicators and Warnings (I&W) and navigational recommendations for UAS in order to improve their autonomy, safety, and energy efficiency. Using all available environmental and navigational data, WARP will assess environmental impacts to planned/executing flight plans and generate alerts and recommendations for those plans based on expected environmental impacts. Operating in conjunction with existing and emerging mission planners and ground control systems (GCS), WARP will use a combination of rules-based/heuristic and simulation-based approaches to assess environmental impacts to UAS flight plans and provide I&W and recommendations for each UAS to avoid negative environmental impacts and take advantage of positive environmental impacts. WARP will also provide real-time environmental impact assessments during mission execution, assisting ground-based pilots, and eventually UAS autonomous controllers, in performing dynamic re-planning for safer and more efficient flight.

Primary U.S. Work Locations and Key Partners





Weather Aware Route Planning (WARP), Phase II

Table of Contents

Weather Aware Route Planning (WARP), Phase II

Completed Technology Project (2016 - 2018)

Organizations Performing Work	Role	Type	Location
Daniel H. Wagner Associates, Inc.	Lead Organization	Industry	Exton, Pennsylvania
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Pennsylvania	Virginia

Project Transitions

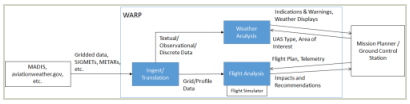
April 2016: Project Start

October 2018: Closed out

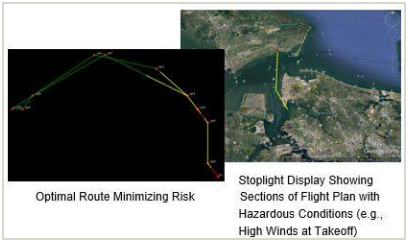
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139857)*

Images



Briefing Chart Image
Weather Aware Route Planning (WARP), Phase II
(https://techport.nasa.gov/image/137155)



Final Summary Chart Image
Weather Aware Route Planning (WARP), Phase II
(https://techport.nasa.gov/image/135144)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Daniel H. Wagner Associates, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

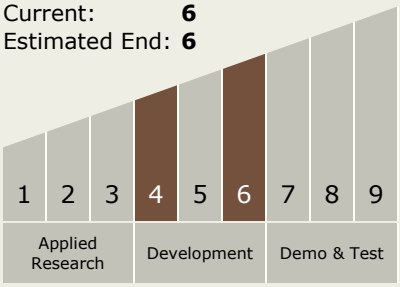
Carlos Torrez

Principal Investigator:

James Eanes

Technology Maturity (TRL)

Start: **4**
Current: **6**
Estimated End: **6**



Weather Aware Route Planning (WARP), Phase II

Completed Technology Project (2016 - 2018)

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  - TX17.2 Navigation Technologies
    - TX17.2.3 Navigation Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System